

Modelagem de sistemas dinâmicos - Ex aula (8/09)

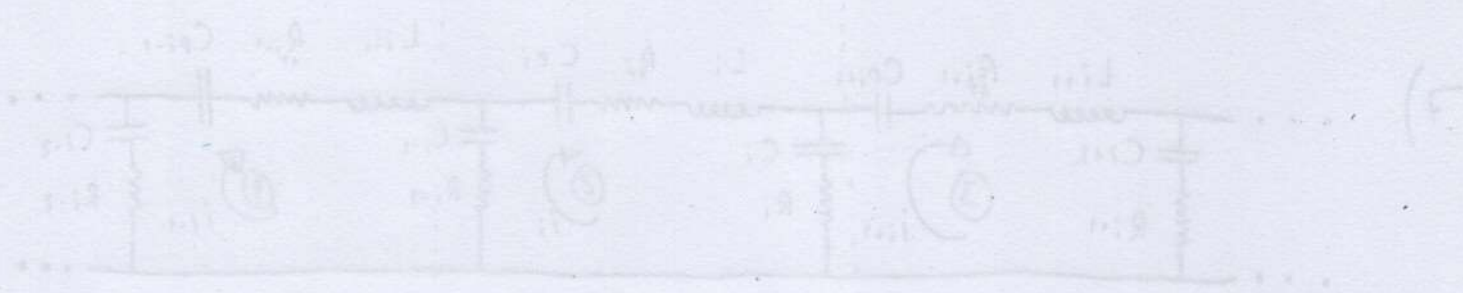
3) ?

$$i_1(L_1 D + R_1) = \left(\frac{1}{C_1} + s\right) i_1 - \left(\frac{1}{C_2} + s\right) i_2 \quad (1)$$

$$0 = \left(\frac{1}{C_2} + s\right) i_1 - \left(\frac{1}{C_2} + s\right) i_2 \quad (2)$$

$$i_1 \ddot{x}_1 + \dot{x}_1 (R_1 + \frac{1}{C_1}) + x_1 (\frac{1}{C_1} + \frac{1}{C_2}) = \frac{1}{C_2} i_2 \quad (3)$$

$$i_2 \ddot{x}_2 + \dot{x}_2 (R_2 + \frac{1}{C_2}) + x_2 (\frac{1}{C_2} + \frac{1}{C_1}) = 0 \quad (4)$$



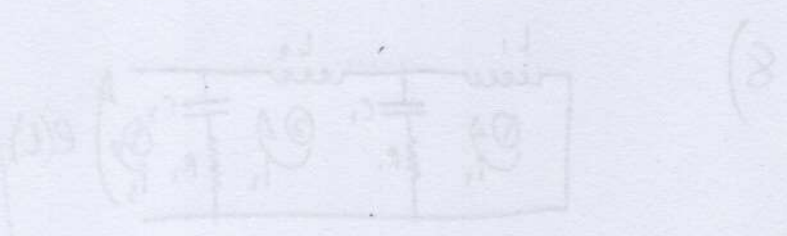
$$i_1 (L_1 D + R_1 + R_2 + \frac{1}{C_1} + \frac{1}{C_2}) = \frac{1}{C_2} i_2 \quad (5)$$

$$\ddot{x}_1 m_1 + \dot{x}_1 (p_1 + p_2 + p_3) + x_1 (k_1 + k_2 + k_3) = \frac{1}{C_2} i_2 \quad (6)$$

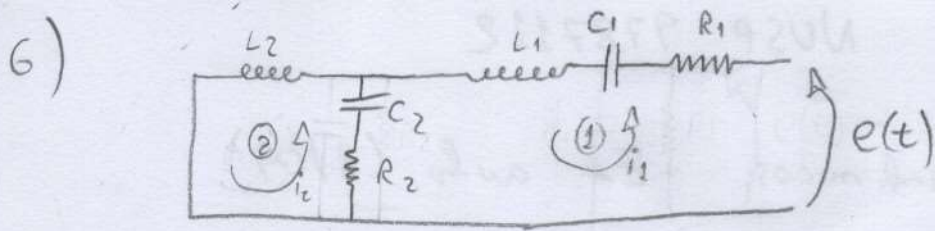
$$i_1 (L_1 D + R_1 + \frac{1}{C_1}) = \frac{1}{C_2} i_2 \quad (7)$$

$$i_2 (L_2 D + R_2 + \frac{1}{C_2}) = \frac{1}{C_1} i_1 \quad (8)$$

$$0 = \left(\frac{1}{C_2} + s\right) i_1 - \left(\frac{1}{C_1} + s\right) i_2 \quad (9)$$



$$i_2 (R_2 + \frac{1}{C_2}) = e(t) \quad (10)$$

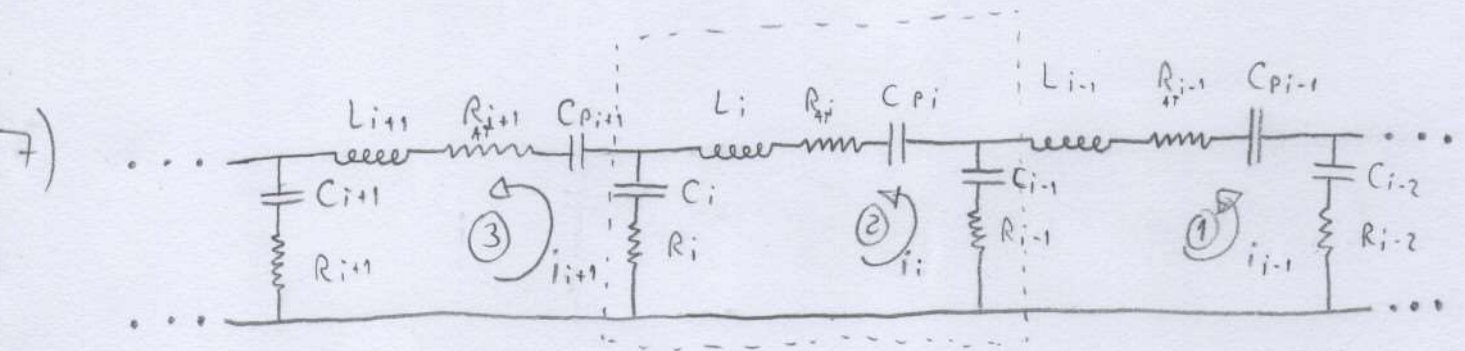


$$\textcircled{1} i_1 \left( L_1 D + R_1 + \frac{1}{C_1 D} + R_2 + \frac{1}{C_2 D} \right) - i_2 \left( R_2 + \frac{1}{C_2 D} \right) = e(t)$$

$$\textcircled{2} i_2 \left( L_2 D + R_2 + \frac{1}{C_2 D} \right) - i_1 \left( R_2 + \frac{1}{C_2 D} \right) = 0$$

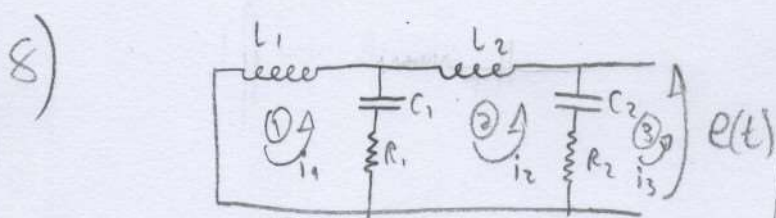
$$\textcircled{1} \ddot{x}_1 m_1 + \dot{x}_1 (b_1 + b_2) + x_1 (k_1 + k_2) - \dot{x}_2 b_2 - x_2 k_2 = f(t)$$

$$\textcircled{2} \ddot{x}_2 m_2 + \dot{x}_2 b_2 + x_2 k_2 - \dot{x}_1 b_2 - x_1 k_2 = 0$$



$$\textcircled{2} i_i \left( L_i D + R_i + R_{at_i} + R_{i-1} + \frac{1}{C_i} + \frac{1}{C_{p_i}} + \frac{1}{C_{i-1}} \right) - i_{i-1} \left( R_{i-1} + \frac{1}{C_{i-1}} \right) = 0$$

$$\ddot{x}_i m_i + \dot{x}_i (b_i + b_{at_i} + b_{i-1}) + x_i (k_i + m g \sin \theta + k_{i-1}) - \dot{x}_{i-1} b_{i-1} - x_{i-1} k_{i-1} = 0$$



$$\textcircled{1} i_1 \left( L_1 D + R_1 + \frac{1}{C_1 D} \right) - i_2 \left( R_1 + \frac{1}{C_1 D} \right) = 0$$

$$\textcircled{2} i_2 \left( L_2 D + R_2 + R_1 + \frac{1}{C_2 D} + \frac{1}{C_1 D} \right) - i_1 \left( R_1 + \frac{1}{C_1 D} \right) - i_3 \left( R_2 + \frac{1}{C_2 D} \right) = 0$$

$$\textcircled{3} i_3 \left( R_2 + \frac{1}{C_2 D} \right) = e(t)$$